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10/543,173	07/22/2005	Masaki Yamada	274300US2PCT	7941

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EXAMINER	
CAVALLARI, DANIEL J	

ART UNIT	PAPER NUMBER
2836	

NOTIFICATION DATE	DELIVERY MODE
10/29/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/543,173	YAMADA ET AL.	
	Examiner	Art Unit	
	DANIEL CAVALLARI	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 June 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-12 and 15-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5,7-12 and 17-19* is/are rejected.

7)☒ Claim(s) *6 and 16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/23/2009 has been entered.

Response to Arguments

Applicant's arguments, see "Remarks", filed 6/23/2009, with respect to 112, second paragraph rejections of claims 1, 3-12 and 15-19 in regard to the "serial" and "parallel" connections have been fully considered and are persuasive. These 112 second paragraph rejections have been withdrawn.

Applicant's arguments with respect to the prior art rejection of the claims have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments in regard to the 112, second paragraph rejection in regard to the term "pseudo-sinusoidal" has been fully considered but is not persuasive.

Applicant argues that the term "pseudo-sinusoidal voltage wave" is "clear in view of the specification, and thus definite to one of ordinary skill in the art" (see Remarks, page 9). Applicant further points out that "More particularly, the specification shows for **examples** in

Figures 2(a) and 2(b) **how a pseudo-sinusoidal voltage wave is generate**..." (see Remarks, page 9). Mere examples of how a "pseudo-sinusoidal voltage wave" is generated is does not provide an adequate and specific definition to the term "pseudo-sinusoidal voltage wave" thereby making the term definite. Although the claims are read in light of the specification, terms and limiting components are not read into the claims from the specification.

The scope of the term "pseudo-sinusoidal voltage wave" is indefinite making it unclear what "voltage waves" would be covered by the term. For example, would a triangle wave be a "pseudo-sinusoidal voltage wave"? What about a standard square wave? And how does one distinguish between a standard sinusoidal wave and a "pseudo-sinusoidal"? Applicant suggests that these deficiencies in the terms clarity is corrected by looking at the specification which provides **examples** of how a "pseudo-sinusoidal" is generated suggesting that the means in which the wave is formed (as read into the claim from the specification via examples) corrects these uncertainties. The Examiner cannot agree. As explained above, the examples of generation of a "pseudo-sinusoidal" voltage in the specification is insufficient support for defining and use of the term in the claims.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5, 11, 12, and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regard to claims 5 and 19

(1) The term "pseudo-sinusoidal voltage wave" is not one ordinarily used in the art to refer to a particular voltage waveform nor does the specification provide an adequate limiting definition (noting the specification merely provides examples of its generation but no actual definition). The distinction and differences between a "pseudo-sinusoidal voltage wave" and a actual sinusoidal waveform and other known types of waveforms is unclear;

(2) The phrase "after **decreasing in the** system voltage" is unclear; and

(3) There is lack of antecedent basis for the phrase "the system voltage" noting that no "system" has been previously claimed.

In regard to claim 11

(1) There is lack of antecedent basis for the term "the direct current voltage";

(2) There is a lack of antecedent basis for the phrase "the single phase inverter or rectifier generating a lowest voltage" since "the single phase inverter or rectifier generating the lowest voltage" is not disclosed in the preceding claims;

(3) The phrase "is 0.5 or more times the direct current voltage… generating a lowest voltage" is confusing because of the multiple antecedent issues in the claim disclosed above; and

(4) Since an inverter does not have a "DC output', the limitation of "0.5 or more times **the direct current voltage** of the single phase **inverter or rectifier generating a lowest voltage** (which is a "direct current voltage")" is inappropriate since an inverter produces AC output and NOT a DC output.

In regard to claim 12

(1) There is a lack of antecedent basis for the term "the direct current voltage"; and

(2) There is a lack of antecedent basis for the term "said second DC-DC converter"

noting that neither a "second" nor a "first" DC-DC converter is claimed in the preceding claims.

In order to expedite and avoid piecemeal prosecution, the following rejection is made to the extent that the claims are understood, by considering those elements which are understood and interpreting their function in a manner which is consistent with the recited goals of the claims, and then applying the best available art.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 4, 5, 8, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (US 2005/0116547) (hereinafter referred to as Lin) in view of Shirahama et al. (US 5,115,386) (hereinafter referred to as Shirahama).

In regard to Claim 1

Lin teaches:

A power supply apparatus comprising:

a straightforward switch (43, see fig2) connected in series (noting 43 supplying power with switch 51 and 56 open) between a power source (INPUT AC VOLTAGE) and a load (output of 40, see fig2 and 5), and that supplies or interrupts an electric power output from the power source to the load;

a first inverter or rectifier (11, 12, fig2) connected in parallel with the series connection of the power source and the straightforward switch;

a second single phase inverter or rectifier (21, 22) connected in series with said load (connected in series when switches 43, 52, and 54 are open and 53 and 55 are closed, see fig2) ; and

a battery (30) connected to direct current side terminals (read on by the connection points of the battery line to the inverter or rectifiers) of said first and second single phase inverters or rectifiers;

wherein said first and second single inverters or rectifiers are connected **so as to be connected** in series with each other (noting with a failure of 21 and 12, the first and second inverters or rectifiers are connected so as to be connected in series with 11 feeding 22) when said straightforward switch (43) is open to thereby each supply their respective electric powers to the load by each supplying their respective output voltages to the load (noting that in a series connection, each of 11 and 22 supply their output power to the load).

Lin fails to explicitly teach the use of "single phase inverter or rectifier" and is in fact silent in regard to the number of phases in the power supply apparatus.

However, Shirahama teaches a single phase power supply apparatus comprising a single phase inverter (see column 12, lines 52-56). It would have been obvious to one of ordinary skill in the art at the time the invention was made to create a single phase power supply apparatus with Lin as taught by Shirahama. The motivation would have been to provide a single phase power supply system since single phase power is widely used and needed and since single phase power production is known and widely used in the art.

In regard to Claim 4

Lin further teaches:

The power supply apparatus according to claim 1, wherein the first (11, fig2) and second (22, fig2) single phase inverters or rectifiers are connected so that their output voltages are different from each other (noting that 11 produces DC voltage output and 22 produces AC voltage output, which are different voltages than one another).

In regard to Claim 5

Lin further teaches:

The power supply apparatus according to claim 1, wherein the first and second single phase inverters or rectifiers form a pseudo-sinusoidal voltage wave (noting 112 issue above) comprising a voltage waveform (AC) having a plurality of output levels (AC voltage output) to output it to the load, by combining their output voltages (noting they are in series which

combines voltage outputs) after decreasing in **the system voltage** (noting lack of antecedent basis) and opening of the straightforward switch (opening of switch 43).

In regard to Claim 8

The power supply apparatus according to claim 1, wherein the first single phase inverter or rectifier is comprised of a plurality of inverters or rectifiers (11 and 12, see fig2) connected in series with each other (connected in series when switches 53 and 55 are open).

In regard to claim 9

Lin further teaches:

At least two of direct power sources provided to said plurality of single phase inverters or rectifiers (see 30 and 30', fig2) however fails to explicitly teach the DC sources comprising a voltage relationship of 1:2, or 1:3.

However, it would have been an obvious matter to size the DC sources (batteries) in a 1:2 or 1:3 voltage relationship, since such a modification would have involved a mere change in size of a component and change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

In regard to Claim 11

Lin teaches the use of multiple inverter and rectifiers but fails to explicitly teach the DC output of rectifiers (noting the 112 issues if claim 11 above and further noting that inverters produce AC outputs)

However, it would have been an obvious matter of design choice to size the rectifiers in a "0.5 or more times" relationship , since such a modification would have involved a mere change in size of a component and change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237 (CCPA 1955)

Claims 3, 7, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (US 2005/0116547) (hereinafter referred to as Lin) in view of Shirahama et al. (US 5,115,386) (hereinafter referred to as Shirahama) and Suzuki et al. (US 2004/0066094) (hereinafter referred to as Suzuki).

Incorporating all arguments above in regard to the power supply apparatus taught by Lin, Lin teaches batteries directly connected to the rectifiers or inverters and fails to teach an intervening dc/dc converter.

Suzuki teaches a power supply apparatus wherein a bi-directional dc/dc converter is used to connect a battery to an inverter (see fig5) thereby give and receive energy through the DC-DC converter (noting the battery is giving and receiving between both inverters or rectifiers of Lin since it is connected between them). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the dc/dc converter between the battery and other components as taught by Suzuki into the apparatus of Lin. The motivation would have been to provide the proper operating voltage and further provide additional conversion capabilities for cleaner power.

Claims 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (US 2005/0116547) (hereinafter referred to as Lin) in view of Shirahama et al. (US 5,115,386) (hereinafter referred to as Shirahama) and Schneider (US 2006/0202636).

In regard to claim 15

Incorporating all arguments above, Lin fails to explicitly teach what type of switch is used.

Schneider teaches the use of a semiconductor switch (See 30, fig1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the semiconductor type switch as taught by Schneider in place of the switch of Lin since semiconductor switches are well known and readily available and it is well known to use semiconductor switches in power supply apparatuses.

In regard to claim 17

Incorporating all arguments above, Lin teaches a bypass switch and power conversion circuitry but fails to explicitly teach a detector used to open/close said switch when an abnormal voltage drop is detected.

Shibata teaches a voltage drop detector configured to detect if a system voltage from said power source abnormally drops in magnitude, and open said switch when an abnormal system voltage drop is detected.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the voltage drop detector taught by Shibata with the power supply

apparatus taught by Lin. The motivation would have been to provide a known voltage detector with the predictable result of controlling the switch wherein Lin is silent in regard to the particular circuitry used and switching scheme of switching between primary AC and backup power.

Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. (US 2005/0116547) (hereinafter referred to as Lin) in view of Shirahama et al. (US 5,115,386) (hereinafter referred to as Shirahama), and Suzuki et al. (US 2004/0066094) (hereinafter referred to as Suzuki).

In regard to Claim 18

Lin teaches:

A power supply apparatus comprising:

a straightforward switch (43, see fig2) connected in series (noting 43 supplying power with switch 51 and 56 open) between a power source (INPUT AC VOLTAGE) and a load (output of 40, see fig2 and 5), and that supplies or interrupts an electric power output from the power source to the load;

a first inverter or rectifier (11, 12, fig2) connected in parallel with the series connection of the power source and the straightforward switch;

a second single phase inverter or rectifier (21, 22) connected in series with said load (connected in series when switches 43, 52, and 54 are open and 53 and 55 are closed, see fig2) ; and

a battery (30) connected to direct current side terminals (read on by the connection points of the

battery line to the inverter or rectifiers) of said first and second single phase inverters or rectifiers;

wherein said first and second single inverters or rectifiers are connected **so as to be connected** in series with each other (noting with a failure of 21 and 12, the first and second inverters or rectifiers are connected so as to be connected in series with 11 feeding 22) when said straightforward switch (43) is open to thereby each supply their respective electric powers to the load by each supplying their respective output voltages to the load (noting that in a series connection, each of 11 and 22 supply their output power to the load).

Lin fails to explicitly teach the use of "single phase inverter or rectifier" and is in fact silent in regard to the number of phases in the power supply apparatus.

However, Shirahama teaches a single phase power supply apparatus comprising a single phase inverter (see column 12, lines 52-56). It would have been obvious to one of ordinary skill in the art at the time the invention was made to create a single phase power supply apparatus with Lin as taught by Shirahama. The motivation would have been to provide a single phase power supply system since single phase power is widely used and needed and since single phase power production is known and widely used in the art.

Incorporating all arguments above in regard to the power supply apparatus taught by Lin, Lin teaches batteries directly connected to the rectifiers or inverters and fails to teach an intervening dc/dc converter.

Suzuki teaches a power supply apparatus wherein a bi-directional dc/dc converter is used to connect a battery to an inverter (see fig5) thereby give and receive energy through the DC-DC converter (noting the battery is giving and receiving between both inverters or rectifiers of Lin since it is connected between them). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the dc/dc converter between the battery and other components as taught by Suzuki into the apparatus of Lin. The motivation would have been to provide the proper operating voltage and further provide additional conversion capabilities for cleaner power.

In regard to Claim 19

Lin further teaches:

The power supply apparatus according to claim 1, wherein the first and second single phase inverters or rectifiers form a pseudo-sinusoidal voltage wave (noting 112 issue above) comprising a voltage waveform (AC) having a plurality of output levels (AC voltage output) to output it to the load, by combining their output voltages (noting they are in series which combines voltage outputs) after decreasing in **the system voltage** (noting lack of antecedent basis) and opening of the straightforward switch (opening of switch 43).

Allowable Subject Matter

Claims 6, 10, and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In regard to claim 6

Suzuki et al. (US 2004/0066094) teaches a power supply apparatus wherein PWM is used to compensate for voltage fluctuations (See Figures 14 and 15) however prior art fails to teach the particular structure of Applicant's claim 1 and the combination of the PWM compensation as taught by Suzuki is not combinable with that of the power supply apparatus of Lin et al.

In regard to claims 10 and 16

Kim et al. (US 5,514,915) teaches providing reactive power compensation (see column 2, lines 20-32) however prior art fails to teach applicant's power supply structure of claim 1 wherein said first single phase inverter or rectifier is controlled so that a current which compensates reactive power in a normal condition flows through the power source.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Cavallari whose telephone number is 571-272-8541. The examiner can normally be reached on Monday-Thursday 9:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rexford Barnie can be reached at (571)272-7492. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Daniel Cavallari/

October 24, 2009

/Albert W Paladini/
Primary Examiner, Art Unit 2836 10/26/09